# First report of *Pyricularia oryzae* causing blast on *Sorghum halepense* (Johnson grass) in Iran

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Johnson grass or Johnsongrass (*Sorghum halepense*) is a grass in the Poaceae. It is a common weed in tropical and temperate climates throughout the world, and is considered as one of the world's 10 worst weeds (Anderson, 1969). *Pyricularia oryzae* is a major pathogen of important food crops such as wheat, rice millets, and of weed plants (Pordel et al., 2018). In October 2017, during blast disease survey of cereal fields in Guilan province of Iran, twenty samples of Johnson grass plants that showed typical symptoms of blast on the leaves and seeds were collected from several rice fields in which blast was observed. Leaves were surface sterilized for 2 min in 1% sodium hypochlorite, dried on filter paper, and then incubated on wet filter paper at 25 °C. Conidia produced on these surface-sterilized leaf pieces were transferred to water agar (WA). Single hyphal tips emerging from germinating conidia were then transferred to potato dextrose agar medium (PDA, Merck Co.) (Pordel et al. 2015). Mycelia of the isolates on PDA was smooth, hyaline, branched, with septate hyphae that were 2–3 µm in diameter. Conidiophores were solitary, erect, straight, or curved, septate, pale brown, and measured 82-235 µm × 3-4 µm. Conidiogenous cells were sympodial, denticulate. Conidia were pale brown, pyriform, 2-septate, 19-27 (-30) × 7-9 µm. Based on morphological characteristics, the isolates were identified as *Pyricularia oryzae* (Ellis 1971; Klaubauf et al. 2014; Pordel et al. 2015). To confirm identification, we sequenced the Internal Transcribed Spacer (ITS) region of the rDNA for one isolate (named strain 58-1) using primers ITS4 and ITS5 (White et al. 1990). The sequence was deposited in GenBank under accession number MT229206. The ITS sequence of the isolate showed 100% identity (473/473 base pairs) with *P. oryzae* CBS 433.70 (MH859782) isolated from rice by BLASTn tool and, thus, the strain was identified as *P. oryzae*. For confirming Koch's postulate, Johnson grass leaves were inoculated using methods described by Silue et al. (1992) with spore suspension of 58-1. Briefly, seeds of the Johnson grass were planted in 10-cm-diameter plastic pots that were kept in the greenhouse for two weeks. *P. oryzae* 58-1 was cultured on water agar onto which sterile rice leaves were placed for 21 days at 25°C under a 12 h dark /12 h fluorescent light regime (Pordel et al. 2018). Conidia of 58-1 were scraped and washed off the rice leaves with 3–5 ml of sterile distilled water. A 10 ml of conidia suspension, adjusted to $2 \times 10^5$ spores per 10ml with 0.5% gelatin, was sprayed on Johnson grass seedlings (Silue et al., 1992). Plants inoculated with a solution of 0.5% gelatin were used as a control. After five days, typical blast type lesions with pale centers were visible on leaves of all inoculated plants. No symptoms were observed on the control plants. The fungus was re-isolated

from leaf lesions of inoculated plants and morphologically identified. To our knowledge, this is the first report of blast disease on Johnson grass in Iran. Johnson grass is thus an alternative host of the pathogen and therefore could be considered as a source of inoculum for cereal crops. Consequently, weed management could be effective way to reduce the disease by eliminating inoculum sources of *P. oryzae*.

## References

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